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# *Calotes emma* Gray, 1845 (Squamata: Agamidae): range extension and new addition to the reptilian fauna of Tripura, northeast India

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**Abstract:** Two new records of *Calotes emma* Gray, 1845, are reported from Srirampur and Homnpui in the state of Tripura, northeast India. These records are the first from Tripura. Present locality records extended the known distribution of *C. emma* in Southeast Asia.

**Key words:** *Caloes emma*, Agamidae, Lizard, range extension, Tripura, northeast India

Reptiles are one of the most diverse groups of animals on earth (Evans 2003), and they are adapted to a wide variety of habitats (Vitt *et al.* 2003). In India, 202 species of lizards have been reported till date. Of these, the family Agamidae is represented by 47 species under 17 genera (Venugopal 2008; Aengals *et al.* 2011). The northeastern parts of India are home to only 14 species of agamid lizards represented under 7 genera (Ahmed *et al.* 2009). Particularly from the state of Tripura 6 species of agamid lizards under 5 genera have been recorded so far including the most common lizard, *Calotes versicolor* (Daudin) (Sanyal *et al.* 2002; Majumder *et al.* 2012). However, none of these earlier studies have been reported the presence of spiny-headed forest lizard, *Calotes emma* Gray, from the state of Tripura.

During a faunistic survey in Dhalai and North districts of Tripura (Figure 1) in May 2012, we came across two live specimens of a lizard: one at Srirampur (24°07′25.63″ N, 091°46′26.01″ E, 191 m a.s.l. [above sea level], Dhalai Tripura) on 5 May 2012 and another at Homnpui (24°02′12.30″ N, 092°14′59.35″ E, 655 m a.s.l., North Tripura) 7 May 2012. Both of these specimens were collected using an insect sweeping net (30 cm diameter × 70 cm long) attached to a long wooden handle. Collected specimens were photographed and released soon after necessary morphological observations (*e.g.,* body colour, scale patterns, head, and eye and limb structures) and measurements (*e.g.,* snout–vent length, from snout tip to cloaca; tail length, from cloaca to tail tip; and number of midbody scale rows) (Table 1). For each specimen, selected morphometric measurements were made to the nearest 1 mm with the help of a measuring tape.

These specimens are identified as *Calotes emma* Gray, 1845 (Figure 2), based on morphological characters: *viz.,* snout a little longer than the orbit; cheeks swollen in the adult male; three small groups of spines, completely separate from each other, on each side of the head-one behind the superciliary margin and two above each tympanum. The dorsal crest is well developed on the neck and on the anterior part of the trunk and gradually disappears behind. The gular sac is little developed. The series of scales round the middle of the trunk ranges from 49–65 in number. Eyelids have short, radiating brown streaks, a brown band from behind the eye to above the tympanum. The fold before the shoulder is black, with an irregular white margin; body colour light olive-brownish above, with dark brown dorsal bars. Legs and tail have indistinct dark cross bands. The tail is compressed (Boulenger1890; Smith 1935; Daniel 2002).

The Spiny-headed Forest Lizard, *Calotes emma*, belongs to the family Agamidae in the order Squamata. This species is widely distributed in Southeast Asia and is known to occur in Myanmar (10.362° N, 098.6253° E) (Vindum *et al.* 2003), southern China (25.2813° N, 098.8371° E) (Schmidt 1925), Vietnam (14.3413° N, 108.4794° E) (Bobrov and Semenov 2008), Malaysia (5.4196° N, 100.2687° E) (Grismer *et al.* 2010), Cambodia (14.2234°N, 106.9936° E) (Grismer *et al.* 2008) Thailand (8.9148° N, 098.5278° E) and Laos (16.9622° N, 105.9902° E) (Boulenger 1890), and Bangladesh (Satchari National Park [Satachari NP]: 24°07′34.87″ N, 091°26′12.70″ E, 58 m a.s.l.) (Reza and Mukul 2009). In northeast India, the species is recorded from Assam (Barail Wildlife Sanctuary: 24°58.692′ N, 092°47.491′ E, 85 m a.s.l.) (Das *et al.* 2009), Mizoram (Dampa Tiger Reserve [Dampa TR]: 23°36.03′ N, 092°25.16′ E, 85m a.s.l.; Ngengpui Wildlife Sanctuary: 22°05′ N, 092°47′ E; Herhse: 23°58′ N, 092°41′ E, 310 m a.s.l.) (Pawar *et al.* 2004) and Meghalaya (Khasi Hills) states (Smith 1935).

**Table 1.** Morphometric measurements of *Calotes emma* recorded from Tripura.

| Sl. No. | Specimen observed | SVL length (cm) | TL Length (cm) | No. of MSR |
|---|---|---|---|---|
| 1. | One adult male | 11.10 | 22.50 | 59 |
| 2. | One sub-adult male | 8.70 | 17.30 | 52 |

* SVL – Snout-vent length; TL – Tail length; MSR – Midbody scale rows.

Present locality records extends the known distribution of *C. emma* in northeast India, extending its distribution *ca.* 31 km to the east (Satachari National Park to Srirampur) and 84 km to the southeast (Satachari National Park to Homnpui) of the nearest known occurrence in neighboring Bangladesh, and 91 km to the southwest (Dampa Tiger Reserve to Srirampur) and 51 km to the southwest (Dampa Tiger Reserve to Homnpui) of the nearest Indian occurrence in the state Mizoram.

The species is diurnal, and occurs in forest-floor as well as arboreal in habits and found along stream margins of secondary mixed moist deciduous forests of Srirampur, Dhalai Tripura and in semi-evergreen forests of Homnpui, North Tripura. The two new occurrences are 53.7 km apart from each other. The dominant vegetation of at these sites consists of *Albizia procera* (Roxb.) Benth., *Dendrocalamus longispathus* Kurz., *Glochidion multiloculare* (Roxb. ex Willd.) Mull. Arg., *Melocanna baccifera* Roxb., *Mangifera indica* L., *Tectona grandis* L., *Saraca asoca (*Roxb.) Wilde, *Duabanga grandiflora* (Roxb. ex DC.) Walpers, *Garcinia cowa* Roxb. and *Bambusa tulda* Roxb. at Srirumpur, and *Saraca asoca (*Roxb.) Wilde, *Duabanga grandiflora* (Roxb. ex DC.) Walpers, *Albizia procera* (Roxb.) Benth., *Mangifera sylvatica* Roxb., and *Mitragyna rotundifolia* (Roxb.) O. Kuntze trees with patchily distributed *Bamusa tulda* Roxb. at Homnpui. *Calotes emma*

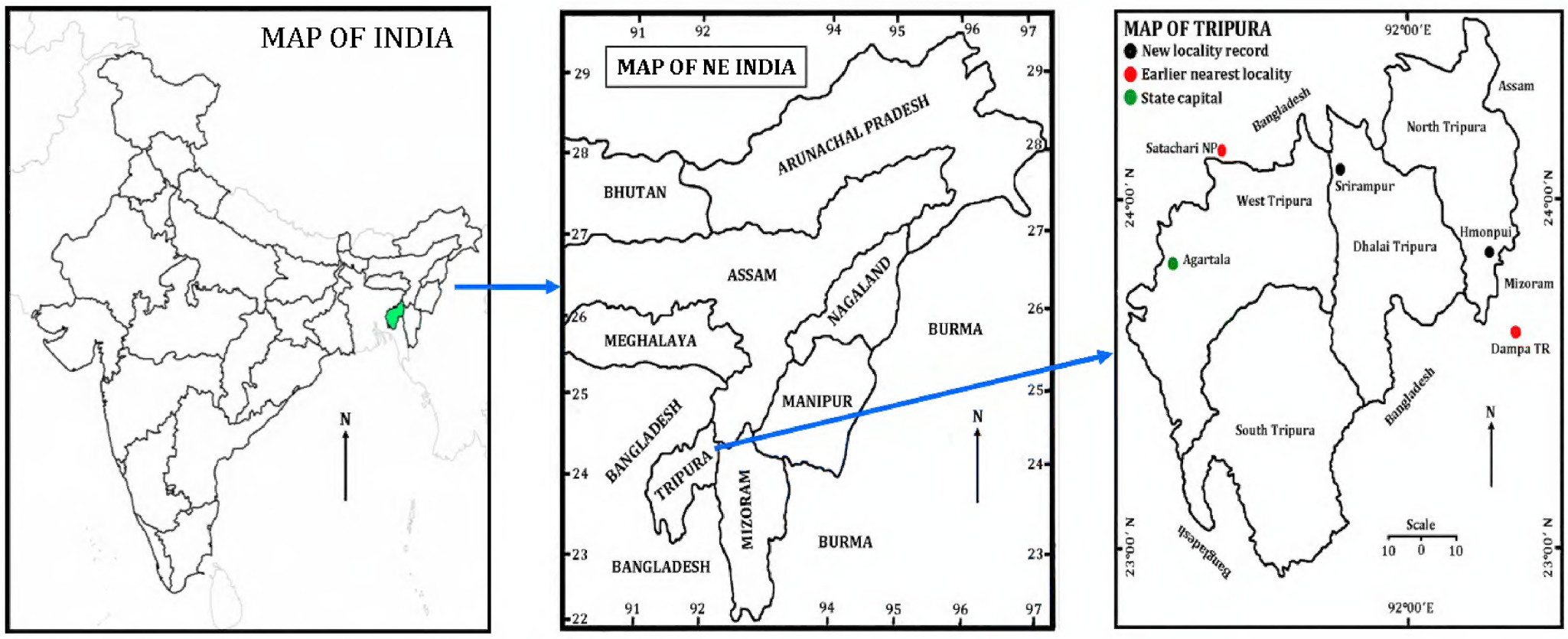


**Figure 1.** Location map of Tripura showing new locality and earlier nearest locality records of *Calotes emma*.

**Figure 2.** *Calotes emma* (inset shows the spiny structure on head) recorded from Homnpui, North Tripura.

foraged on the top surface of understory vegetation as well as on the forest floor along side a narrow slow flowing seasonal streams at both the locations and is found to feed on grasshoppers, ants, termites, cockroaches, beetles, diverse species of moths and low flying butterflies, and soil-living insects and their larvae. These lizards also blend in perfectly with their surroundings.

In last two decades, a large part of natural forests and other non-cultivated land of Tripura has been brought under rubber (*Hevea brasiliensis* Mull. Arg.) plantations (ca. 513.06 km$^2$) (Economic Review of Tripura 2010–2011), and age-old method of slash and burn cultivation by the ethnic tribes is also prevalent in hilly parts of the state (Majumder *et al.* 2012). These activities have fragmented forest habitat and may affect the foraging and breeding habitats of *Calotes emma*. However, further studies are required to establish the threats to this species in Tripura.

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